UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/730,817	12/08/2003	Daniel Owen	1801270.00134US1	4224

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| WILMERHALE/BOSTON |
| 60 STATE STREET |
| BOSTON, MA 02109 |

EXAMINER
KANG, INSUN

ART UNIT	PAPER NUMBER
2193	

NOTIFICATION DATE	DELIVERY MODE
09/08/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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	Application No.	Applicant(s)
	10/730,817	OWEN ET AL.
Office Action Summary	Examiner	Art Unit	
	INSUN KANG	2193	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 May 2008*.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4,6-8,14-18,20,23,25-27,33-38,41,43-45 and 51-55* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 4, 6-8, 14-18, 20, 23, 25-27, 33-38, 41, 43-45, 51-55* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1.   This action is in response to the amendment filed on 5/28/2008.

2.   Claims 1, 4, 6-8, 14-18, 20, 23, 25-27, 33-38, 41, 43-45, 51-55 are pending in the

application.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

4.   Claims 1, 4, 6-8, 14-18, 20, 23, 25-27, 33-38, 41, 43-45, 51-55 are rejected under

35 U.S.C. 103(a) as being unpatentable over Srivastava et al. (US 6,609,248) hereafter

Srivastava, in view of Fujii et al. (US Pg. Pub. 2004/0015888) hereafter Fujii.

        Per claim 1:

        Srivastava discloses converting binary executable program code of a subject

computing architecture into binary target code executed on a target computing system

(i.e. col. 3 lines 19-28). Srivastava does not explicitly teach that conversion is performed

dynamically. However, Fujii teaches such a dynamic binary translation was known in the

pertinent art, at the time applicant's invention was made, to dynamically translate a

program at runtime ("dynamic binary translation,"0010). It would have been obvious for

one having ordinary skill in the art to modify Srivastava's disclosed system to incorporate

the teachings of Fujii. The modification would be obvious because one having ordinary

skill in the art would be motivated to perform the binary translation from the intermediate

representation disclosed in Srivastava only when the code is actually discovered at

runtime.

Srivastava further discloses:

-wherein conversion of the program code is interleaved with execution of the target

code on the target computing system (i.e. col. 14 lines 52-55; the EXE' 203 in Fig. 2A is

a target specific executable for a target system, col. 8 lines 22-30)

-decoding a plurality of instructions in the program code (i.e. "After the instructions

in the code blocks have been translated,," col. 7 lines 20-21)

-determining which type of nodes to generate in an intermediate representation for

each of the decoded instructions in the program code (i.e. "Once the code and data blocks

are identified, an IR creation process 212 evaluates each platform-dependent instruction

on a block-by-block basis," col. 6 lines 65-67),

-including determining that one or more of the decoded instructions require base

nodes having basic RISC-like functionality which provides an expanded representation of

semantics of the decoded instructions (i.e. "For RISC …architectures,…instructions can

be easily translated into a single platform-neutral IR instruction," col. 7 lines 3-6),

-and one or more of the decoded instructions require complex nodes having complex

CISC-like functionality which provides a compact representation of semantics of the

decoded instructions (i.e. "On the other hand, CICS…contain complex instructions that

provide the function of multiple instructions," col. 7 lines 5-8);

-generating the intermediate representation of the decoded instructions using the

determined types of nodes, including generating the base nodes and the complex nodes in

the intermediate representation from the respective decoded instructions (i.e. "the

platform-dependent instructions that have a single platform-neutral IR instruction

counterpart are translated into that platform-neutral instruction, while complex

instructions are replicated as-is within the IR through an extended version of the basic IR

instruction," col. 7 lines 9-20);

-generating the target code from the intermediate representation and executing the

target code on the target computing system (i.e. "Blocks of instructions that were

originally written for one architecture can be translated from the intermediate

representation into platform-specific instructions for a different architecture," col. 14

lines 52-55; the EXE' 203 in Fig. 2A is a target specific executable for a target system,

col. 8 lines 22-30).

Per claim 4:

Srivastava further discloses:

-   wherein the base nodes are generic across a plurality of possible subject

    computing architectures (i.e. "a single platform-neutral IR instruction," col. 7

    lines 1-3).

Per claim 6:

Srivastava and Fujii do not explicitly teach that the determining step includes that

the program code includes immediate type instructions in which a constant operand value

is encoded into the instruction itself in an immediate field and in response determining

that the immediate type instructions require the complex nodes.   However, a CISC-like

functionality includes such immediate type instructions. Therefore, it would have been

obvious for one having ordinary skill in the art to modify Srivastava and Fujii's disclosed

system to include specific CISC functionalities such as immediate type instructions in the

determining step so that such CISC-like instructions can be "replicated as-is within the IR

through an extended version of the basic IR instruction (col. 7 lines 5-20)."

   Per claim 7:

Srivastava further discloses:

- wherein each of the complex nodes may be decomposed into a plurality of the base

nodes to represent the same semantics of an instruction in the decoded program code (i.e.

"*CISC* (Complex Instruction Set Computer) …contain complex instructions (col. 7 lines

5-10) which are composed with basic blocks that can be discomposed back into basic

blocks).

Per claim 8:

Srivastava further discloses:

-   generating the complex nodes only for those features which are correspondingly

    configurable on the subject computing architecture (i.e. "A replicated complex

    instruction is marked with a signature that denotes its architecture," col. 7 lines

    13-16).

 Per claim 14:

Srivastava further discloses:

- determining that one ore more of the decoded instructions require architecture

specific nodes (i.e. "set of platform-specific instructions to perform the same

function as the original, complex instruction," col.8 lines 63-65).

Per claim 15:

Srivastava further discloses: generating the intermediate representation to include

the architecture specific nodes which are specific to a particular combination of the

subject computing architecture and the target architecture (i.e. col. 8 lines 55-65).

Per claim 16:

Srivastava further discloses: initially representing all of the instructions in the

program code as subject architecture specific nodes, where each subject architecture

specific node corresponds to a respective instruction in the program code (i.e. col. 6 lines

55-65); determining whether an instruction in the program code is one in which to

provide a target architecture specialized conversion function; (i.e. col. 6 lines 65-67);

converting the subject architecture specific nodes into target architecture specific

nodes for those instructions determined to provide a target architecture specialized

conversion function (i.e. col. 8 lines 56-65);

generating the base nodes from the remaining subject architecture specific nodes

which are not identified as providing a-the target architecture specialized code generation

function (i.e. col.7 lines 1-5).

Per claim 17:

Srivastava further discloses: generating the target code from the target architecture specific nodes, wherein the target code is specialized for the target architecture (i.e. col. 8 lines 55-65).

Per claim 18:

Srivastava further discloses: generating the target code from the base nodes, wherein the target code is not specialized for the target architecture (i.e. col. 7 lines 1-5).

Per claims 20, 23, 25, 26, 27, and 33-37, they are the medium versions of claims 1, 4, 6-8, and 14-18, respectively, and are rejected for the same reasons set forth in connection with the rejection of claims 1, 4, 6-8, and 14-18 above.

Per claims 38, 41, 43-45, and 51-55, they are the apparatus versions of claims 1, 4, 6-8, and 14-18, respectively, and are rejected for the same reasons set forth in connection with the rejection of claims 1, 4, 6-8, and 14-18 above.

Response to Arguments

7.   Applicant's arguments filed 5/28/2008 have been fully considered but they are not persuasive.

8.   The applicant states that: it is not possible for the ordinary skilled person to combine the static translation of heterogeneous programs as in Srivastava with a processor system for dynamic binary translation as in Fujii. It is not a simple or straightforward modification to combine the static user-oriented translation of a heterogeneous program as in Srivastava with a dynamic binary translation system as in Fujii (remark, 13).

In response, selecting either static or dynamic translation method whichever is more efficient is typically performed in the pertinent art. For the code that is not statically translated, the dynamic translation is usually applied as the code value is known at runtime as in Fujii. In addition, the instant specification states that "translation can be performed statically or dynamically (i.e. page 6, 0026)." Furthermore, the claims do not recite which parts of the translation are dynamic. Therefore, the combination of Srivastava and Fujii is not impossible. For the interleaving conversion order, the order logic could be full conversion of program and execution, and subsequent conversion of program and execution. Therefore, Applicant's argument that a new system and method for dynamic binary translation which is not disclosed in any of the prior art documents is not persuasive. If applicant means anything more, this must be brought out in the claims to further clarify the invention.

*** Conclusion ***

9.   Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the

advisory action. In no event, however, will the statutory period for reply expire later than

SIX MONTHS from the date of this final action.

10.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to INSUN KANG whose telephone number is (571)272-

3724. The examiner can normally be reached on M-F 8:30-5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Lewis A. Bullock, Jr. can be reached on 571-272-3759. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-

8300. Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published

applications may be obtained from either Private PAIR or Public PAIR. Status

information for unpublished applications is available through Private PAIR only. For

more information about the PAIR system, see http://pair-direct.uspto.gov. Should you

have questions on access to the Private PAIR system, contact the Electronic Business

Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO

Customer Service Representative or access to the automated information system, call

800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Insun Kang/
Examiner, Art Unit 2193

/Lewis A. Bullock, Jr./
Supervisory Patent Examiner, Art Unit 2193